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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 11

Application Number: 09/222,092
Filing Date: December 29, 1998
Appellant(s): HUNT ET AL.

Lyndanne M. Whalen (29,457)
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 11 September 2001.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claim 21 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

This appeal involves claims 1-20.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows: (issue A) the 35 U.S.C. 112, second paragraph rejection of claim 1 and (issue G) the 35 U.S.C. 103(a) rejection of claim 21 have been withdrawn.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-20 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct (except for what appears to be a typographical error in claim 1, *i.e.*, "the_lens" should be --the lens--).

(9) Prior Art of Record

5,532,817	***DeVries et al.***	***7-1996***
4,824,209	***Bolton et al.***	***4-1989***
5,818,577	***Duclos et al.***	***10-1998***
EP 0 458 474	***Burchill***	***11-1991***
6,001,936	***Barrera et al.***	***12-1999***
4,415,516	***Krueger et al.***	***11-1983***

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 2, 6, 7, 9, 11-15, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by DeVries *et al.* (US 5,532,817).

In regard to claims 1, 2, 6, 7, 9, 11, and 12, DeVries *et al.* disclose an apparatus comprising:

(a) a source (*e.g.*, a lamp) that illuminates with long wavelength ultraviolet light (*e.g.*, 365 nm) a composite-forming material whereby a binder (*i.e.*, resin) has been applied (column 7, lines 9-14);

(b) a filter or filter system which removes the illumination ultraviolet light but allows the longer wavelength fluorescent light to pass (column 7, lines 11-31);

(c) a lens (*i.e.*, stereoscope) for imaging (column 7, lines 15-18);

(d) a camera (*e.g.*, a camera that produces color images) which detects the image formed by the lens (*i.e.*, stereoscope) and generates an electrical signal (column 7, line 21; column 7, lines 50-63); and

(e) a means to correlate recorded images to binder (*i.e.*, resin) dosage and distribution (column 7, line 50 to column 8, line 37).

In regard to claim 13 which is dependent on claim 1, DeVries *et al.* also disclose (column 7, lines 56-61) that the correlation means is capable of enhancing the images.

In regard to claims 14 and 15, DeVries *et al.* disclose a method comprising:

(a) illuminating (column 7, lines 9-14) with ultraviolet light a substrate (*e.g.*, composite-forming material) whereby a binder (*i.e.*, resin) has been applied;

(c) collecting (column 7, lines 15-18) fluorescent light emitted by binder (*i.e.*, resin);

(b) passing (column 7, lines 11-31) collected light through a filter system which removes the illumination ultraviolet light but allows the longer wavelength fluorescent light to pass;

(d) imaging (column 7, line 15-21; column 7, lines 50-63) the fluorescence emitted by binder (*i.e.*, resin) and generates an electronic signal; and

(e) relaying (column 7, line 50 to column 8, line 3; column 8, lines 33-37) the electronic signal to means (*e.g.*, programmed computer) for correlating recorded images to binder (*i.e.*, resin) dosage and distribution.

In regard to claim 19 which is dependent on claim 14, DeVries *et al.* also disclose (column 7, lines 27 and 28; column 8, lines 10-12) that filters can be used to select the fluorescence from the binder (*i.e.*, resin).

In regard to claim 20 which is dependent on claim 14, DeVries *et al.* also disclose (column 7, lines 56-61) that the correlation means is capable of enhancing the images.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeVries *et al.* (US 5,532,817) in view of Bolton *et al.* (US 4,824,209).

The apparatus of DeVries *et al.* lacks an explicit description that the source comprises of 4 or more lamps. It is well known in the art that an illumination source can include a plurality of lamps in order to provide enough lighting for a given situation. Further, Bolton *et al.* teach that a source can include a plurality of lamps (claim 1). Therefore it would have been obvious to one having ordinary skill in the art to provide a

plurality of lamps as the source in the apparatus of DeVries *et al.*, in order to have adequate lighting for fluorescence imaging.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeVries *et al.* (US 5,532,817) in view of Duclos *et al.* (US 5,818,577).

DeVries *et al.* teach (column 7, line 28-31) that the filters in a filter system are chosen to block light from the illumination source and to pass the fluorescent light. The apparatus of DeVries *et al.* lacks an explicit description that the plurality of filters are positioned before the lens. It is well known in the art that a plurality of filters can be positioned before and/or after the lens. For example, Duclos *et al.* teach (Fig. 4) that a filter (201, 202) is positioned before the lens (181). Therefore it would have been obvious to one having ordinary skill in the art to position the plurality of filters in the apparatus of DeVries *et al.* before the lens, since the purpose of the filters is to select a wavelength range of light to be detected and the purpose of the lens is to image the fluorescence from binder and/or substrate (*e.g.*, composite-forming material) onto the camera.

Claims 5, 8, 10, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeVries *et al.* (US 5,532,817) in view of Burchill (EP 0 458 474).

In regard to claim 5, DeVries *et al.* teach that the filters in a filter system are chosen to block light from the illumination source and to pass the fluorescent light (column 7, line 28-31). The apparatus of DeVries *et al.* lacks an explicit description that the plurality of filters are positioned after the lens. It is well known in the art that a plurality of filters can be positioned before and/or after the lens. For example, Burchill

teaches (Fig. 2) that a filter (25) is positioned after the lens (23). Therefore it would have been obvious to one having ordinary skill in the art to position the plurality of filters in the apparatus of DeVries *et al.* after the lens, since the purpose of the filters is to select a wavelength range of light to be detected and the purpose of the lens is to image the fluorescence from binder and/or substrate (*e.g.*, composite-forming material) onto the camera.

In regard to claims 8 and 10, DeVries *et al.* teach that the filters in a filter system are chosen to block light from the illumination source and to pass the fluorescent light (column 7, line 28-31). The apparatus of DeVries *et al.* lacks an explicit description that the filter includes a long pass filter with cutoff wavelength between 400 and 600 nm or a near infrared blocking filter. It is well known in the art that a plurality of filters can be selected from band pass filters and/or blocking filters. In addition, applicant has acknowledged that these types of filters are commercially available (pg. 11 and 12). As another example, Burchill teaches that the plurality of filters can be selected from band pass filters and/or near infrared blocking filters to block both ultraviolet and infrared radiation from the ultraviolet lamp and to pass the fluorescent light (column 8, lines 7-20). Therefore it would have been obvious to one having ordinary skill in the art to provide band pass filters and/or near infrared blocking filters as the plurality of filters in the apparatus of DeVries *et al.*, in order to block both ultraviolet and infrared radiation from the ultraviolet lamp and to pass the fluorescent light so as to select a wavelength range of light to be detected.

In regard to claim 18 which is dependent on claim 14, DeVries *et al.* teach that the filters in a filter system are used to block light from the illumination source and to pass the fluorescent light (column 7, line 28-31). The method of DeVries *et al.* lacks an explicit description of the use of a near infrared blocking filter. It is well known in the art that a plurality of filters can be selected from band pass filters and/or blocking filters. In addition, applicant has acknowledged that these types of filters are commercially available (pg. 11 and 12). As another example, Burchill teaches that the plurality of filters can be selected from band pass filters and/or near infrared blocking filters to block both ultraviolet and infrared radiation from the ultraviolet lamp and to pass the fluorescent light (column 8, lines 7-20). Therefore it would have been obvious to one having ordinary skill in the art to provide near infrared blocking filters as the plurality of filters in the method of DeVries *et al.*, in order to block infrared radiation from the ultraviolet lamp and to pass the fluorescent light so as to select a wavelength range of light to be detected.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeVries *et al.* (US 5,532,817) in view of Barrera *et al.* (US 6,001,936).

DeVries *et al.* teach that any binder (*i.e.*, resin) that fluoresces is suitable for fluorescent optical inspection and the method by which suitability is determined (column 6, line 60 to column 7, line 8). The method of DeVries *et al.* lacks an explicit description that the binder is a polyisocyanate-based material (*e.g.*, polyphenylene polymethylene polyisocyanate). Barrera *et al.* teach that a polyisocyanate-based material (*e.g.*, polyphenylene polymethylene polyisocyanate) has measurable fluorescence (column 7,

line 64 to column 8, line 22; column 1, lines 54-62). Therefore it would have been obvious to one having ordinary skill in the art to provide a polyisocyanate-based material (*e.g.*, polyphenylene polymethylene polyisocyanate) as the binder in the method of DeVries *et al.* since polyphenylene polymethylene polyisocyanate is suitable for fluorescent optical inspection because of its measurable fluorescence.

(11) Response to Argument

Summary of Appellant's arguments

Issue B

B1. Appellants argue that the benzocyclobutene moiety is critical to the DeVries *et al.* method and that appellants' binder need not employ the benzocyclobutene moiety critical to DeVries *et al.* (see fifth paragraph on pg. 4 to first paragraph on pg. 5 of appellant's brief on appeal filed 11 September 2001).

B2. Appellants argue that the resin in the DeVries *et al.* method is a "fully formed polymer" and that appellants' binder is "not a fully formed polymer" (see paragraphs 2-5 on pg. 5 of appellant's brief on appeal filed 11 September 2001).

B3. Appellants argue that the DeVries *et al.* method is used to inspect thickness and concentration of the resin on the substrate surface and that appellants' method is used to determine distribution and dosage (see sixth paragraph on pg. 5 to second paragraph on pg. 6 of appellant's brief on appeal filed 11 September 2001).

B4. Appellants argue that the DeVries *et al.* method does not teach or suggest inspection of material during actual production and that appellants' method is used during actual production (see paragraphs 3-5 on pg. 6 of appellant's brief on appeal filed 11 September 2001).

B5. Appellants argue that the DeVries *et al.* method does not teach determination of binder dosage and distribution (see sixth paragraph on pg. 6 to third paragraph on pg. 7 of appellant's brief on appeal filed 11 September 2001).

B6. Appellants argue that the DeVries *et al.* method requires the use of UV light at a specific wavelength and that appellants' method is not limited to use of UV light at one wavelength (see paragraphs 4-5 on pg. 7 of appellant's brief on appeal filed 11 September 2001).

Issue C

C1. Appellants repeat argument B1 (see last two paragraphs on pg. 7 of appellant's brief on appeal filed 11 September 2001).

C2. Appellants argue that Bolton does not teach correlation means or benzocyclobutene moiety (see paragraphs 2-4 on pg. 8 of appellant's brief on appeal filed 11 September 2001).

Issue D

D1. Appellants argue that Duclos *et al.* do not teach benzocyclobutene moiety (see last two paragraphs on pg. 8 to second paragraph on pg. 9 of appellant's brief on appeal filed 11 September 2001).

Issue E

E1. Appellants argue that Burchill does not teach benzocyclobutene moiety (see last two paragraphs on pg. 9 of appellant's brief on appeal filed 11 September 2001).

Issue F

F1. Appellants argue that Barrera *et al.* do not teach benzocyclobutene moiety (see paragraphs 2-3 on pg. 10 of appellant's brief on appeal filed 11 September 2001).

Response to Argument B1

First, it should be noted that the invention of DeVries *et al.* (see abstract) is directed to a method for determining the configuration of a resin portion of an article. DeVries *et al.* teach (column 1, lines 13-28) that optical inspection utilizing the fluorescent properties of a resin is an useful method for determining the configuration (*e.g.*, shape, uniformity of thickness, presence or absence of voids, contaminants, mounts of excess material, presence or absence of resin, concentration of the fluorescing species or inclusions in the resin or the like) during or after the processing steps used to fabricate a finished article containing the resin in electronic or other applications. It is clear from DeVries *et al.*'s disclosure that the article or part comprises of a material and a resin. Composite is defined[1] as "made up of distinct components". Thus the composite article or part of DeVries *et al.* comprises of at least two distinct components (a composite-forming material and a resin). Binder is defined[1] as

"something ... that creates uniform consistency, solidification, or cohesion". Resin is defined[1] as " ... solid or semisolid, viscous substances ... used principally in lacquers, varnishes, inks, adhesives, synthetic plastics, and pharmaceuticals". Thus it is clear that binder is substantially equivalent to resin. Therefore, DeVries *et al.* disclose a source of long wave ultraviolet light positioned so that ultraviolet waves emitted therefrom will come into contact with a composite-forming material to which binder has been applied during the production of composite materials. DeVries *et al.* also teach (column 7, line 50 to column 8, line 37) that image processing options expand the ability to detect and identify defects in thin films. Furthermore, it is noted that dosage is defined[1] as "addition of an ingredient to a substance in a specific amount" and concentration is defined[1] as "the amount of a specified substance in a unit amount of another substance". Thus it is clear that dosage and concentration are synonyms (*i.e.*, equivalence of meaning). It is also noted that distribution is defined[1] as "the act of dispersing or the condition of being dispersed" or "a spatial or temporal array of objects or events" and uniform is defined[1] as "always the same, as in character or degree; unvarying". Thus, "determination of distribution on a substrate" is equivalent in meaning to "determination of thickness and uniformity of a material on a substrate". DeVries *et al.* explicitly teach that the method can determine thickness of the resin and coating uniformity (column 8, lines 33-37). Therefore, DeVries *et al.* disclose a device capable of correlating images received by the video camera to binder dosage and distribution on the composite-forming material to which binder has been applied

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[1] The American Heritage® Dictionary of the English Language, Third Edition copyright © 1992 by

contacted by the ultraviolet waves emitted by the UV light source. Thus DeVries *et al.* anticipates the apparatus as recited in independent claim 1 and the method as recited in independent claim 14.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, binder need not employ benzocyclobutene) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus, this argument cannot be given patentable weight. Furthermore even if appellants' argument is considered, Examiner respectfully disagrees with appellants' argument that the benzocyclobutene moieties is critical to the DeVries *et al.* method. Appellants have cited column 3, lines 5-7 of DeVries *et al.* as support for this interpretation. The cited passage teaches it is important to have a fluorescing resin and that a non-fluorescing resin is not within the scope of the DeVries *et al.* invention. DeVries *et al.* explicitly exclude resins containing benzocyclobutene moieties which are non-fluorescing (see the first sentence in the cited passage). DeVries *et al.* also teach that it is beneficial to use the fluorescent properties of the resin for optical inspection but unfortunately not all resins are inherently fluorescent at useful wavelengths (column 1, lines 23-28). DeVries *et al.* further teach that a fluorescence spectrometer may be used to screen resins for suitability for fluorescent optical inspection (see column 6, lines 60 and 61). If appellants' argument

is correct, there is no need to screen a resin for suitability for fluorescent optical inspection as taught by DeVries *et al.* Thus DeVries *et al.* teach a method for fluorescent optical inspection of an article containing a fluorescent resin during or after fabrication.

Response to Argument B2

In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (*i.e.*, "not fully formed polymer") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). It is noted that claim 1 and depending claims are apparatus claims and that the preamble recites for determining binder dosage and distribution during the production of composite material. It is noted that claim 14 and depending claims are method claims and that the preamble recites for determining binder dosage and distribution during the production of composite material. There are various steps in the production of a product, and the state of the resin depends on the step as which a measurement of the resin is made. Thus while one of ordinary skill would readily appreciate that a binder is applied (*i.e.*, not fully formed polymer) then cured (*i.e.*, fully formed polymer), the claim does not limit at which step (*i.e.*, before or after curing) during production the resin is measured. Furthermore even if appellant's argument is considered, Examiner respectfully disagrees with appellants' argument that the resin

being inspected in the DeVries *et al.* method is a fully formed polymer and thus different than a "not fully formed polymer". DeVries *et al.* explicitly teach the determination of resin properties "during or after the processing steps" (column 1, lines 15-17).

Response to Argument B3

In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (*i.e.*, distribution of the reactive binder through out the substrate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Appellants have stated that " ... present invention relates to ... monitoring ... dosage and distribution on a surface ... " and showed images of material coated with a binder (pg. 1, lines 3-5; Figs. 3-7 and 12-14; pg. 5, lines 7-16, 28, and 29; pg. 6, lines 1-6 of specification). The Figs. clearly shows that only images of surface distribution was obtained with Appellant's invention. Thus, Appellant has not describe (or claim) an invention which determines the distribution of the reactive binder throughout the substrate. Furthermore as noted above, dosage and concentration are synonyms (*i.e.*, equivalence of meaning) and "determination of distribution on a substrate" is equivalent in meaning to "determination of thickness and uniformity of a material on a substrate". DeVries *et al.* explicitly teach that the method can determine thickness of the resin and coating uniformity (column 8, lines 33-37). Thus DeVries *et al.* teach a method for determining dosage and distribution of a fluorescent resin.

Response to Argument B4

In regard to Appellant's argument that DeVries *et al.* does not teach or suggest that the disclosed method could be used to inspect materials during actual production of those materials, Examiner respectfully disagrees. DeVries *et al.* explicitly teach the determination of resin properties "during or after the processing steps" (column 1, lines 15-17). It is also noted that the location within the DeVries *et al.*'s reference at which DeVries *et al.* teach the determination of resin properties during actual production of those materials is immaterial to the fact that DeVries *et al.* teach the determination of resin properties during actual production of those materials. Further, DeVries *et al.* teach that inspection of resin properties (*e.g.*, concentration) during or after the processing steps can be performed as described on columns 7 and 8.

Response to Argument B5

Appellant argue that DeVries *et al.* does not disclose a means for correlating recorded images to binder dosage and distribution. Examiner respectfully disagrees. It is noted that Appellant has defined dosage as "amount of binder applied" and distribution as surface coverage (pg. 1, lines 12-14 of specification). Since coating uniformity and surface coverage are equivalent, the method and apparatus of DeVries *et al.* can be used to determine distribution from images.

Response to Argument B6

In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (*i.e.*, a plurality of wavelengths in the ultraviolet) are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore even if appellant's argument is considered, Examiner respectfully disagrees with appellants' argument that DeVries *et al.* requires the use of a UV light source at a specific wavelength and does not teach or suggest that UV light having a range of different wavelengths could be used. DeVries *et al.* explicitly teach that a range of different wavelengths (*i.e.*, "broad pass filter", see column 7, lines 29, 30, 24, 25) or a specific wavelength (column 7, lines 25 and 26) could be used to illuminate the substrate.

Response to Argument C1

See response to Argument B1.

Response to Arguments C2, D1, E1, and F1

In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

For the above reasons, it is believed that the rejection of claims 1-20 should be sustained.

Respectfully submitted,

SL
October 29, 2001

An appeal conference was held 25 October 2001 with the following conferees:

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